**Grade 7 & 8 Science & Literacy Planning**

**Grade**: 8 **Unit**: Cells

OVE #1 : assess the impact of cell biology on individuals, society

and the environment (STSE connection)

**BE** **(attitudes, beliefs, CGE)**

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-understand the role of technology in understanding our cells

-impact of cell processes on human health/environment

-impact of scientific inquiry/experimentation on cellular processes

* Cell theory
* Organelles/ organization
* Compare plant & animal cells
* Diffusion & osmosis

-safety procedures

-use of microscope

-use scientific inquiry

-experimentation skills

-prepare wet/dry mount slides

-cell drawings

**KNOW (content)** OVE #3 **DO (skills)** OVE #2

OVE #3: demonstrate an understanding of the OVE #2: investigate functions and processes of plant

basic structure and function of plant and and animal cells

animal cells

**Big Ideas**:

\*Cells are the basis of live. (OVE 2, 3)

\*Cells organize into tissues, tissues into organs, organs into organ systems, and organ systems into

organisms. (OVE 2, 3)

\*Healthy cells contribute to healthy organisms. (OVE 1, 2)

\*Systems are interdependent. (OVE 1, 3)

**Inquiry Questions*:***

How do our actions affect the world around us?

Why is the cell considered the basic unit of life?

What challenges are presented by advances in cell research & technology?

**Opportunities for pre-assessment of knowledge and skills:**

- Exploring unit starter (page 4 – 6)

“Mysterious Deaths” reading & discussion: assess background knowledge

“One Big Cell” Quick Lab making connections, inferring, predicting, modelling

“Using an Insecticide” STSE connection: assess background knowledge, ability to make connections

\*Getting started features for each chapter( reading & discussion or quick labs)

Ch. 1: pg. 10-11 brainstorm ideas of why mortality rates were so high pre-1900s

Ch. 2: p.36-7

Ch. 3: p.60-1

\*TLCP pre-assessment question

\*Anticipation guide: Line Master A-3 (Teacher Resource, Cells, pg. 85)

\*[www.cellsalive.com](http://www.cellsalive.com) – “Interactive Cell Models” with a focus on animal cells

**Opportunity for cross-strand connections in science**

\*Online article: How dense is a cell?

<http://web.mit.edu/newsoffice/2011/cell-density-0621.html>

* make connections with the fluids strand

\*Cell membrane bubbles: <http://bit.ly/iJvCHz> (see p.27)

* can be used as a starting point for Smarter Science

**Designing With the End in Mind**

***Assessment “of” Learning:*** *Unit task, culminating performance task integrated with other subject area(s)...*

\*Newspaper article – Integrated with Language (writing & science) (OVE 1)

\*Unit Task: “The Cell” – theme park pg. 83 in student text/ pg. 75 in teacher’s resource, cells

Find an entertaining way to tell people about cells and their importance 🡪 Integrated with

Language (oral/visual, media)

(OVE 2, 3)

\* Unit test/quiz (OVE 3)

**Inquiry Based Learning**

**Unit task breakdown:** what are the skills necessary to complete this task, what subtasks are involved...

\***Newspaper article** – follow “Thinking Literacy” boxes in Chapter 3

* Before Writing p. 59 – sample articles on science topics
* During Writing p. 69
* During Writing p. 75
* After Writing p. 80

Also see Line Master A-15 “The Structure of a Newspaper Article” (Teacher’s Resource, p. 104)

and Line Master A-16 “PMI Organizer” (Teacher’s Resource, p. 105)

**\*Unit Task: “The Cell” – theme park**

* Unit task introduced in student text, pg. 7
* Chapter 1 Unit task link, p. 33
* Chapter 2 Unit task link, p. 57
* Chapter 3 Unit task link, p. 81
* Unit A Task: Come and Visit “The Cell”! p. 83
* Unit Task Assessment Rubric Line Master A-18 p. 110 in Teacher’s Resource

Breakdown of task:

1. Need to know parts of cell (appearance, structure, function)
2. Need to know cellular processes: osmosis and diffusion
3. Background knowledge - need to know what a theme park looks like
4. Background Knowledge- Brochures (Literacy Connection)
5. Students draw a schematic of the theme park
6. Students choose appropriate materials for cell organelles
7. Assemble the “Cell Theme Park” at school
8. Model creating a Brochure using the ***Word Document Gallery- Brochures (Media Literacy)***
9. Students should bring all materials to school and assemble the Theme Park

**Teacher Demo:**

* Starting Point A30 Yeast in Action, p. 50
* Diffusion Egg Demo, Idea #571 in “The Idea Bank Collation” by Irwin Talesnick
* Both of these can be starting points for “Smarter Science”
* **Consider the following to help build student knowledge:**
  + Quick Lab A6 Care and Use of a Microscope, p. 15
  + Quick Lab A11 Preparing Dry Mount Slides, p. 21
  + Consider using procedure cut outs and overhead slides posted on wiki

(<http://dpcdsb-ssc.wikispaces.com/Smarter+Science>)

* + Quick Lab A12 Preparing Wet Mount Slides, p. 22
    - alternate or practice: **Virtual Compound Microscope:** <http://www.udel.edu/biology/ketcham/microscope/scope.html>
  + Quick Lab A20 Meeting Basic Needs for Survival, p. 37

**Student Inquiries:**

* Quick Lab A10 Building a Cell, p. 21
* Inquiry Activity A16 Diffusion Detective, p. 28
* Inquiry Activity A17 Food for Thought, p. 29
* Inquiry Activity A23 Observing Unicellular Organisms, p. 41
* Inquiry Activity A27 Observing Multicellular Organisms, p. 47
* Design a Lab, Cells and Solutions, p. 48
* Alternative: use Gizmos to investigate...

**Cell Structure**

Select sample cells from a plant or animal and place the cells on a microscope to look inside the cells. Information about their common structures is provided (and the structures are highlighted), but you will need to move your microscope slide to find all the different structures.

<http://www.explorelearning.com/index.cfm?method=cResource.dspDetail&ResourceID=450>

**Osmosis**

Adjust the concentration of a solute on either side of a membrane in a cell and observe the system as it adjusts to the conditions through osmosis. The initial concentration of the solute can be manipulated, along with the volume of the cell.

<http://www.explorelearning.com/index.cfm?method=cResource.dspDetail&ResourceID=418>

**Graphic Organizers to consider using:**

* Compare & Contrast (Venn) diagrams for Living vs. Non-living, Plant vs. Animal cells (see Program overview, pg. 50)
* Classify table to organize organs & organ systems (see Program overview, pg. 50)
* KWL – What I know about Cells

**Integration Opportunities:** (Geography, History, Language, The Arts, Virtues, Religion/Family Life...) see literacy curriculum map

**Language, arts, virtues, family life**

* Connections to Religion/Family Life, Virtues:
  + “Perfecting Plants” pg. 23, Section 3.3 “The Impact of Research in Cell Biology” p 72-8
* Connections to Literacy:
  + Media: newspaper articles, brochures
  + See “Thinking Literacy” feature in student text: text features, reading & interpreting graphical text, visualizing with combination notes, summarizing, graphic organizers
  + accountable talk and talk structures for pairs, small groups, large group conversations
  + writing: newspaper articles
  + visual arts: visualizing the cell as a factory or city, pg. 51 and building a cell pg. 21

**Literacy Supports:** (Reading, Writing, Oral, Media) see literacy curriculum map

**Organization of Literacy Supports in Pearson’s**

***Investigating Science & Technology textbooks***

|  |
| --- |
| **Chapter Grade 7 Grade 8** |
| **1 Previewing Text Features** |
| **2 Visualizing** |
| **3** *Letter to Editor Newspaper Article* |
| **4 Making Connections** |
| **5 Inferring** |
| **6** *Question & Answer Problem & Solution* |
| **7 Making Predictions** |
| **8 Monitoring Comprehension** |
| **9** *Sequential/Procedural Compare & Contrast* |
| **10 Determining Importance** |
| **11 Asking Questions** |
| **12** *Cause & Effect Description* |

**Other resources I could use/integrate**: (e.g. The 10 magazines...)

|  |  |
| --- | --- |
| The 10 Coolest Wonders of the Universe |  |
| The 10 Greatest Accidental Inventions | **x** |
| The 10 Most Amazing Bridges |  |
| The 10 Most Essential Elements |  |
| The 10 Most Revolutionary Inventions |  |
| The 10 Deadliest Plants |  |
| The 10 Greatest Threats to Earth |  |
| The 10 Most Essential Chemical Messengers | **x** |
| The 10 Most Extraordinary Medical Conditions | **x** |
| The 10 Most Revolting Parasites | **x** |
| The 10 Most Significant Medical Breakthroughs | **x** |
| The 10 Smartest Adaptations in Nature |  |

**Specific Sections from selected “The 10” resources – possibilities for guided reading/practice:**

The 10 Greatest Threats to the Earth – Biological Weapons, Loss of Biodiversity, Pandemic

The 10 Most Revolting Parasites: Gut Amoeba

The 10 Most Essential Elements: Oxygen

The 10 Greatest Accidental Inventions: Penicillin

**Vocabulary specific to this unit:**

Chapter 1

Cell division, cell theory, compound light microscope, membrane, cytoplasm, organelle, micrographs, impermeable, selective permeability, cellular transport, diffusion, osmosis

* permeable, impermeable, selectively permeable – how are these words related? What does the prefix “im” do to the root word, what does adding the word “selectively” do to the meaning of permeable?
  + See “Words Matter” feature on pg. 13 for meanings of “micro, skopos, tele”

Chapter 2

Microorganism, unicellular, multicellular, specialized cells, cellular respiration, photosynthesis

* prefixes:
  + micro, uni, multi, photo – meanings & brainstorm lists of related words to create “working definitions”
  + see “Words Matter” feature on pg. 39 for meaning of “pseudo” as in pseudopod
  + pg. 39 “flagellum” 🡪root word is flag

Chapter 3

Tissues, organs, skeletal system, circulatory system, respiratory system, respiration, nervous system, digestive system, excretory system, integumentary system, endocrine system, lymphatic system, reproductive system, cancer, tumour, paralysis

**Assessment Opportunities: “for” and “as” Learning:**

For learning:

* learning goals and success criteria
* anticipation guide Line Master A3 (Teacher’s resource, cells, p. 85)
* descriptive feedback (oral & written)
  + during the writing process for the newspaper article
* Line Master A15 The Structure of a Newspaper Article
* Assessment Rubric LM22 – Research Paper/Project
* during inquiries
  + - * Assessment Rubric LM2 Investigation/Inquiry Activity
      * Assessment Rubric LM6 Scientific Skills & Processes: Working Co-operatively
      * “Exploring” unit starters and “Getting Started” chapter features
      * Teacher observations/anecdotal notes & comments
      * Exit cards at end of lessons
      * Online quizzes (sciencesource.ca)
      * KWL chart “What I know about cells”

As learning (self assessment):

* Anticipation guide Line Master A3
* Assessment Rubric LM 6 Scientific Skills & Processes: Working Co-operatively
* Exit cards
* KWL chart
* Unit Task Assessment Rubric Line Master A-18 p. 110 in Teacher’s Resource – students can use this to guide their process